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ART UNIT	**PAPER NUMBER**
2177	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/085,780	FRIEDEN ET AL.	
	Examiner	Art Unit	
	Sathyanarayan Pannala	2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,14-24,30-40,46-56 and 62-64* is/are pending in the application.

4a) Of the above claim(s) *9-13,25-29,41-45,57-61 and 65-82* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,14-24,30-40,46-56 and 62-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicants' election of claims 1-8,14-24,30-40,46-56 and 62-64 was made without traverse in the reply filed on 5/10/2004. Claims 9-13, 25-29, 41-45, 57-61 and 65-82 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Claims 1-8, 14-24, 30-40, 46-56 and 62-64 are pending in this Office Action.

Specification

2. The abstract is objected because the abstract is a copy of the claim 1 and it is also a part of the summary. Corrected abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text. Applicant is reminded of the proper content of an abstract of the disclosure and use the following guidelines:

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly

those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative. The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 8,14, 16-20, 24, 30, 32-36, 40, 46, 48-52, 56, 62 and 64 are rejected under 35 U.S.C. 102(b) as being anticipated by Exley et al. (US Patent 5,724,577) hereinafter Exley.

5. Exley anticipated independent claim 1 by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed step of "identifying one of the records in the hierarchical set of the

records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed step of "modifying the tag, thereby producing a key" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed step of "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the key to the hierarchical set of the records" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39). Finally, Exley teaches the claimed step of "retrieving the selected records" as retrieving data using simple commands (Fig. 4, col. 4, lines 22-27).

6. As per dependent claim 2, Exley teaches the claimed step of "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

7. As per dependent claim 3, Exley teaches the claimed step of "receiving a selection of the one of the records from a user" as the user types a heading then can press one key to display, add or edit any other attributes (Fig. 4, col. 3, lines 55-58). Further, Exley teaches the claimed step of "receiving a command from the user" as placing the cursor on the line enables the user to display all fields of the record (Fig. 4, col. 4, lines 12-13). Finally, Exley teaches the claimed step of "modifying the tag is based on the command from the user" as the key field can be entered automatically or from a pick-list or typed in by the user 32 (Fig. 4, col. 3, lines 58-60).

8. As per dependent claim 4, Exley teaches the claimed step of "displaying a field of each of the retrieved records on a display, wherein the position of each of the fields on the display represents the hierarchical depth and hierarchical level of the corresponding one of the retrieved records" as displaying data from relational database table a may display all relational database entries with a selected parameter attribute or range of parameter attributes (Fig. 4, col. 4, lines 6-12).

9. As per dependent claim 8, Exley teaches the claimed step of "each of the records represents one of a message and a folder" in the current invention involves the organization hierarchical data using a key (tag) and the record may contain any kind of data fields as allowed in a standard hierarchical database (col. 2, lines 7-16).

10. Exley anticipated independent claim 14 by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed step of "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed step of "modifying the tag" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Finally, Exley teaches the claimed step of "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the modified tag to the hierarchical set of the record" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39).

11. As per dependent claim 16, Exley teaches the claimed step of "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys

of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

12. Exley anticipated independent claim 17 (this claim is for a computer program) by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed step of "modifying the tag, thereby producing a key" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the key to the hierarchical set of the records" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39). Finally, Exley

teaches the claimed "retrieving the selected records" as retrieving data using simple commands (Fig. 4, col. 4, lines 22-27).

13. As per dependent claim 18, Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

14. As per dependent claim 19, Exley teaches the claimed "receiving a selection of the one of the records from a user" as the user types a heading then can press one key to display, add or edit any other attributes (Fig. 4, col. 3, lines 55-58). Further, Exley teaches the claimed receiving a command from the user" as placing the cursor on the line enables the user to display all fields of the record (Fig. 4, col. 4, lines 12-13). Finally, Exley teaches the claimed "modifying the tag is based on the command from the user" as the key field can be entered automatically or from a pick-list or typed in by the user 32 (Fig. 4, col. 3, lines 58-60).

15. As per dependent claim 20, Exley teaches the claimed "displaying a field of each of the retrieved records on a display, wherein the position of each of the fields on the display represents the hierarchical depth and hierarchical level of the corresponding one of the retrieved records" as displaying data from relational database table a may display

all relational database entries with a selected parameter attribute or range of parameter attributes (Fig. 4, col. 4, lines 6-12).

16. As per dependent claim 24, Exley teaches the claimed "each of the records represents one of a message and a folder" in the current invention involves the organization hierarchical data using a key (tag) and the record may contain any kind of data fields as allowed in a standard hierarchical database (col. 2, lines 7-16).

17. Exley anticipated independent claim 30 (this claim is for a computer program) by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed step of "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed step of "modifying the tag" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed step of "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the modified tag to the hierarchical set of the record" as each

element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39).

18. As per dependent claim 32, Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

19. Exley anticipated independent claim 33 (this claim is for an apparatus) by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed "modifying the tag, thereby producing a key" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3,

lines 15-21). Further, Exley teaches the claimed "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the key to the hierarchical set of the records" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39). Finally, Exley teaches the claimed "retrieving the selected records" as retrieving data using simple commands (Fig. 4, col. 4, lines 22-27).

20. As per dependent claim 34, Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

21. As per dependent claim 35, Exley teaches the claimed "receiving a selection of the one of the records from a user" as the user types a heading then can press one key to display, add or edit any other attributes (Fig. 4, col. 3, lines 55-58). Further, Exley teaches the claimed receiving a command from the user" as placing the cursor on the line enables the user to display all fields of the record (Fig. 4, col. 4, lines 12-13).

Finally, Exley teaches the claimed "modifying the tag is based on the command from the user" as the key field can be entered automatically or from a pick-list or typed in by the user 32 (Fig. 4, col. 3, lines 58-60).

22. As per dependent claim 36, Exley teaches the claimed "displaying a field of each of the retrieved records on a display, wherein the position of each of the fields on the display represents the hierarchical depth and hierarchical level of the corresponding one of the retrieved records" as displaying data from relational database table a may display all relational database entries with a selected parameter attribute or range of parameter attributes (Fig. 4, col. 4, lines 6-12).

23. As per dependent claim 40, Exley teaches the claimed "each of the records represents one of a message and a folder" in the current invention involves the organization hierarchical data using a key (tag) and the record may contain any kind of data fields as allowed in a standard hierarchical database (col. 2, lines 7-16).

24. Exley anticipated independent claim 46 (this claim is for an apparatus) by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent

heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed step of "modifying the tag" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed step of "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein means for indexing the hierarchical set of the records only once comprises means for applying the modified tag to the hierarchical set of the record " as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39).

25. As per dependent claim 48, Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

26. Exley anticipated independent claim 49 (this claim is for a computer-readable media) by teaching a computer data organization method in which data is organized in a

hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed "modifying the tag, thereby producing a key" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21,such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the key to the hierarchical set of the records" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39). Finally, Exley teaches the claimed "retrieving the selected records" as retrieving data using simple commands (Fig. 4, col. 4, lines 22-27).

27. As per dependent claim 50, Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of

the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

28. As per dependent claim 51, Exley teaches the claimed "receiving a selection of the one of the records from a user" as the user types a heading then can press one key to display, add or edit any other attributes (Fig. 4, col. 3, lines 55-58). Further, Exley teaches the claimed receiving a command from the user" as placing the cursor on the line enables the user to display all fields of the record (Fig. 4, col. 4, lines 12-13). Finally, Exley teaches the claimed "modifying the tag is based on the command from the user" as the key field can be entered automatically or from a pick-list or typed in by the user 32 (Fig. 4, col. 3, lines 58-60).

29. As per dependent claim 52, Exley teaches the claimed "displaying a field of each of the retrieved records on a display, wherein the position of each of the fields on the display represents the hierarchical depth and hierarchical level of the corresponding one of the retrieved records" as displaying data from relational database table a may display all relational database entries with a selected parameter attribute or range of parameter attributes (Fig. 4, col. 4, lines 6-12).

30. As per dependent claim 56, Exley teaches the claimed "each of the records represents one of a message and a folder" in the current invention involves the

organization hierarchical data using a key (tag) and the record may contain any kind of data fields as allowed in a standard hierarchical database (col. 2, lines 7-16).

31. Exley anticipated independent claim 62 (this claim for a computer-readable media) by teaching a computer data organization method in which data is organized in a hierarchical outline with each data element having a key field with a unique identifier to the data element (col. 2, lines 7-11). Exley teaches the claimed "identifying one of the records in the hierarchical set of the records" as the hierarchical screen 22 prompts a user to input data as headings in an outline format, in which children of a parent heading are established in the database (Fig. 2, col. 3, lines 8-11). Further, Exley teaches the claimed "modifying the tag" as a key (tag) unique to the heading is preferably automatically generated by a key generator 21, such as time of the day clock or a unique may be manually entered by an operator (Fig. 2, col. 3, lines 15-21). Further, Exley teaches the claimed "indexing the hierarchical set of the records only once, thereby selecting one or more of the records within the hierarchical set of the records, wherein indexing the hierarchical set of the records only once comprises applying the modified tag to the hierarchical set of the record" as each element in the hierarchical database has at least one row in the relational data table with the key field establishing a linkage between the two databases, which is not changed or altered when the data in the hierarchical database is changed or altered by the user performing standard operations on the hierarchical data (Fig. 3, col. 3, lines 32-39).

32. As per dependent claim 64 (this claim for a computer-readable media), Exley teaches the claimed "selecting those of the records in the hierarchical set of the records having a tag that matches the key" as the user can retrieve and display relational information associated with the unique keys of the data elements in the temporary subset of the hierarchical information structure 42 (Fig. 4, col. 4, lines 27-44).

Claim Rejections - 35 USC § 103

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

34. Claims 5-7, 15, 21-23, 31, 37-39, 47, 53-55 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Exley et al. (US Patent 5,724,577) hereinafter Exley, and in view of Shadmon (US Patent 6,675,173).

35. As per dependent claim 5, Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed step of "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed step of "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed step of "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed step of "modifying the tag comprises: selecting at least one of the digits according to the command from the user" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed step of "changing the value of the selected digits according to the command from the user" as shown in the example (Fig. 5E, col. 12, lines 16-24). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the

cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

36. As per dependent claim 6, Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed step of "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed step of "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed step of "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed step of "the command from the user requests retrieving the children of the identified record" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed step of "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed step of "setting the value of each digit corresponding to a hierarchical depth below the hierarchical

depth corresponding to the selected digit to a wildcard value" as by constructing n (where n >= 1) vertical oriented digital tree structure levels which, along with said first digital tree structure constitute the n+1 vertical oriented digital tree structure levels (col. 2, lines 56-65). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

37. As per dependent claim 7, Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He does not explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed step of "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed step of "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed step of "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed step of "the command from the user requests retrieving the parent of the

identified record" as the nodes are labeled with their depth and nodes with one child are compressed into the parent node, so that all nodes have at least two children (Fig. 3A, col. 2, lines 6-12). Shadmon teaches the claimed step of "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed step of "setting the value of the selected digit to a null value" as the offset size in terms of number of bits that is accommodated within each node may be altered, the manner of realizing pointers that point to null, i.e., having no children (col. 9, lines 34-36). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

38. As per dependent claim 15, Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed step of "each tag includes a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed step of "the position of each of the digits represents one of the hierarchical depths " as the depth position in the key represented by the node (Fig. 3A, col. 2,

lines 10-12). Finally, Shadmon teaches the claimed step of "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

39. As per dependent claim 21 (this claim is for a computer program), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "modifying the tag comprises: selecting at least one

of the digits according to the command from the user" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "changing the value of the selected digits according to the command from the user" as shown in the example (Fig. 5E, col. 12, lines 16-24). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

40. As per dependent claim 22 (this claim is for a computer program), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "the command from the user requests retrieving the children of the identified record" as shown in the

example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "setting the value of each digit corresponding to a hierarchical depth below the hierarchical depth corresponding to the selected digit to a wildcard value" as by constructing n (where n >= 1) vertical oriented digital tree structure levels which, along with said first digital tree structure constitute the n+1 vertical oriented digital tree structure levels (col. 2, lines 56-65). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

41. As per dependent claim 23 (this claim is for a computer program), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He does not explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the

digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "the command from the user requests retrieving the parent of the identified record" as the nodes are labeled with their depth and nodes with one child are compressed into the parent node, so that all nodes have at least two children (Fig. 3A, col. 2, lines 6-12). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "setting the value of the selected digit to a null value" as the offset size in terms of number of bits that is accommodated within each node may be altered, the manner of realizing pointers that point to null, i.e., having no children (col. 9, lines 34-36). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

42. As per dependent claim 31 (this claim if for a computer program), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed

or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag includes a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths " as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels " as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

37. As per dependent claim 37 (this claim is for an apparatus), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14,

lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "modifying the tag comprises: selecting at least one of the digits according to the command from the user" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "changing the value of the selected digits according to the command from the user" as shown in the example (Fig. 5E, col. 12, lines 16-24). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

43. As per dependent claim 38 (this claim is for an apparatus), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14,

lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "the command from the user requests retrieving the children of the identified record" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "setting the value of each digit corresponding

to a hierarchical depth below the hierarchical depth corresponding to the selected digit to a wildcard value" as by constructing n (where n >= 1) vertical oriented digital tree structure levels which, along with said first digital tree structure constitute the n+1 vertical oriented digital tree structure levels (col. 2, lines 56-65). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

44. As per dependent claim 39 (this claim is for an apparatus), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He does not explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "the command from the user requests retrieving the parent of the identified record" as the nodes are labeled with their depth and nodes with one child are compressed into the parent node, so that all nodes have at least two children (Fig. 3A, col. 2, lines 6-12). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "means for setting the value of the selected digit to a null value" as the offset size in terms of number of bits that is accommodated within each node may be altered, the manner of realizing pointers that point to null, i.e., having no children (col. 9, lines 34-36). Thus, it would have been obvious to one of ordinary skill in the data processing

art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

45. As per dependent claim 47 (this claim is for an apparatus), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag includes a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels " as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

46. As per dependent claim 53 (this claim is for computer-readable media), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed " the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "modifying the tag comprises: selecting at least one of the digits according to the command from the user" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "changing the value of the selected digits according to the command from the user" as shown in the example (Fig. 5E, col. 12, lines 16-24). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

47. As per dependent claim 54 (this claim is for a computer-readable media), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "the command from the user requests retrieving the children of the identified record" as the data record value record is 1 (Fig. 5B, col. 10, lines 58-61). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "setting the value of each digit corresponding to a hierarchical depth below the hierarchical depth corresponding to the selected digit to a wildcard value" as by constructing n (where n >= 1) vertical oriented digital tree structure levels which, along with said first digital tree structure constitute the n+1 vertical oriented digital tree structure levels

(col. 2, lines 56-65). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

48. As per dependent claim 55 (this claim is for a computer-readable media), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He does not explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag is a number having a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Shadmon teaches the claimed "the command from the user requests retrieving the parent of the identified record" as the nodes are labeled with their depth and nodes with one child are compressed into the parent node, so that all nodes have at least two children (Fig. 3A, col. 2, lines 6-12). Shadmon teaches the claimed "modifying the tag comprises: selecting the digit corresponding to the hierarchical depth of the identified

record" as shown in the example (Fig. 5E, col. 12, lines 16-24). Shadmon teaches the claimed "setting the value of the selected digit to a null value" as the offset size in terms of number of bits that is accommodated within each node may be altered, the manner of realizing pointers that point to null, i.e., having no children (col. 9, lines 34-36). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance the tree structure and optimize for disk-based access like B-trees (col. 2, lines 33-35).

49. As per dependent claim 63 (this claim is for a computer-readable media), Exley teaches the manipulating the key by entering automatically, or from a pick-list or typed in by the user and after establishing a linkage between the two databases, which is not changed or altered by the user performing standard operation on the hierarchical data (Fig. 3, col. 3, lines 32-39). He explicitly does not teach manipulating the key numbers/digits. However, Shadmon teaches the claimed "each tag includes a plurality of digits" as digital tree structure constructed is shown (col. 10, lines 40-45 and col. 14, lines 64-66). Shadmon teaches the claimed "the position of each of the digits represents one of the hierarchical depths" as the depth position in the key represented by the node (Fig. 3A, col. 2, lines 10-12). Shadmon teaches the claimed "the value of each of the digits represents one of the hierarchical levels" as common key value represents for example upper level, lower level, etc. (Fig. 4, col. 10, lines 16-25). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time

of the invention to combine the teaching of the cited references because Shadmon's teachings would have allowed Exley's method to manipulate separately key digits to represent a hierarchical record to balance and optimize the record in an unbalanced B-tree (col. 2, lines 33-35).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sathyanarayan Pannala whose telephone number is (703) 305-3390. The examiner can normally be reached on 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (703) 305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Sathyanarayan Pannala
Examiner
Art Unit 2177

srp
September 7, 2004